ARITHMETIC.

Conducted by B. F. FINKEL, Springfield, Mo. All contributions to this department should be sent to him.

SOLUTIONS OF PROBLEMS.

NOTE on the Solution of Problem 53, by J. M. COLAW, A. M., Principal of High School, Monterey, Va.

As originally proposed the problem read "with 7% *annual interest* from date," while, it would seem by inadvertence, as reproduced in the November number, it reads "with *interest at 7 per cent.* from date."

I do not find the subject of "Partial Payments on Notes *with Annual Interest*" treated in any of our Arithmetics, except in Olney's *The Science of Arithmetic*, but there are doubtless other exceptions.

On page 191 of *Science of Arithmetic* it is stated that when partial payments are made on notes which bear *Annual Interest*, at other times than those at which the annual interest falls due, the method *usually adopted* is as follows:

Find the interest on the note for 1 year; and find also the amount of the payments made during the year from the times they were severally made to the end of the year.

If the payments amount to more than the interest due, take *their amount* from the amount of the note, and make the remainder a new principal.

But if the amount of the payments does not equal the interest due, the principal remains unchanged, and the amount of the payments is taken from the interest, the remainder being treated as deferred interest.

Proceed in this manner with each year till the time of settlement, the last period being that from the time the last annual interest fell due to the time of settlement.

Mr. Wilke's solution does not follow in all points the rule here laid down as *the usual one*. The question is, what is the rule in Ohio where the note was drawn?

55. Proposed by J. C. CORBIN, Pine Bluff, Arkansas.

How long will it take to count a million, in the following manner: the counter is to pronounce each syllable in the names of the successive numbers at the rate of one per second?

Solution by B. F. YANNEY, A. M., Professor of Mathematics, Mount Union College, Alliance, Ohio.

One, two, ..., nine—10 syllables—of the first order, are each pronounced 9 times in every hundred.

$\therefore$ The total for these is $9 \times 10 \times 10000 =$ 900000.

The same, of the fourth order, are each pronounced 9000 times in every hundred thousand.

$\therefore$ The total for these is $9000 \times 10 \times 10 =$ 900000.

Ten, eleven, ..., nineteen—20 syllables—of the first and second orders, are each pronounced once in every hundred.

$\therefore$ The total for these is $20 \times 10000 =$ 200000.

The same, of the fourth and fifth orders, are each pronounced 1000 times in every hundred thousand.

$\therefore$ The total for these is $10 \times 20 \times 10000 =$ 200000.

Twenty, thirty, ..., ninety—17 syllables—of the second order, are each pronounced 10 times in every hundred.

$\therefore$ The total for these is $10 \times 17 \times 10000 =$ 1700000.

The same, of the fifth order, are each pronounced 10000 times in every hundred thousand.

$\therefore$ The total for these is $10 \times 17 \times 10000 =$ 1700000.

One hundred, two hundred, ..., nine hundred—28 syllables—of the third order, are each pronounced 100 times in every thousand.

$\therefore$ The total for these is $28 \times 100 \times 1000 =$ 2800000.

The same, for the sixth order, are each pronounced 100000 times.

$\therefore$ The total for these is $28 \times 100000 =$ 2800000.

Thousand is pronounced 999000 times.

$\therefore$ The total for this word is 1998000.

The number of syllables in *one million* is 3.

The grand total is 13198003.

$\therefore$ 13198003 seconds=152 days, 18 hours, 6 minutes, 43 seconds, the time required.

[Chas. C. Crose, New Windsor, Maryland, sent in a solution of problem 49. The solution is by Algebra and is very good, but as the space in the MONTHLY is very limited even for unsolved problems, we reluctantly omit his solution. The published solution of problem 49 is not valuable because of its brevity, but because each step is the statement of a very elementary mathematical proposition, and hence can be comprehended by any one who has mastered these simple propositions. It is no discredit to a solution to be long if at the same time it is clear in its statements. EDITOR.]

ALGEBRA.

Conducted by J. M. COLAW, Monterey, Va. All contributions to this department should be sent to him.

SOLUTIONS OF PROBLEMS.

54. Proposed by Professor E. W. MORRELL, Department of Mathematics, Montpelier Seminary, Montpelier, Vermont.

Transform $x^4 + y^4 + z^4 - 2y^2z^2 - 2z^2x^2 - 2x^2y^2$ into a product.